



IN THE CLAIMS

The following claim set replaces all prior versions, and listings, of claims in the application:

1. (Original) A composite structure comprising a coated element, and at least one fiber optic condition sensor embedded physically within a coating of said coated element, wherein said sensor detects a condition of said composite structure.
2. (Original) The structure of claim 1, wherein at least one said fiber optic condition sensor senses a strain or temperature condition of said wire assembly
3. (Original) The structure of claim 1, wherein said coating is a polymeric coating, and wherein said element is an electrical conductor.
4. (Original) The structure of any one of claims 1-3, wherein said at least one fiber optic condition sensor comprises a series of axially spaced apart Bragg gratings written therein.
5. (Original) The structure of claim 1, comprising a plurality of said fiber optic condition sensors each embedded in said coating.
6. (Original) The structure of claim 5, wherein each of said fiber optic condition sensors comprises a series of axially spaced apart Bragg gratings written therein.
7. (Original) The structure of claim 5 or 6, wherein at least one of said fiber optic condition sensors detects a strain condition of said structure, and wherein at least one other fiber optic sensor detects a temperature condition of said structure.

8. (Original) The structure of claim 1, wherein the coating is a magnetorestrictive coating, and wherein said sensor detects strain of said coating in a magnetic field.

9. (Original) A condition detection system comprising a composite structure as in claim 1, a data acquisition system operatively connected to said fiber optic sensor for outputting a signal indicative of a predetermined condition of said structure, and a monitor for receiving the signal and providing an indication of said predetermined condition.

10. (Original) The system of claim 9, wherein said monitor provides a visual and/or aural indication of said predetermined condition.

11. (Original) The system of claim 9, wherein said monitor stores data associated with said predetermined condition.

12. (Original) A wire assembly having integral condition detection capabilities, comprising:

a wire element which includes at least one electrical conductor;
an electrical insulator surrounding said wire element; and
a fiber optic condition sensor in operative association with said electrical insulator to detect a condition of said wire assembly.

13. (Original) The wire assembly as in claim 12, wherein said fiber optic condition sensor is embedded physically within said electrical insulator.

14. (Original) The wire assembly as in claim 12, wherein said wire element includes a plurality of electrical conductors, and wherein said fiber optic condition

sensor is associated physically with said plurality of electrical conductors so as to be surrounded by said electrical insulator.

15. (Original) The wire assembly as in claim 12, wherein said fiber optic condition sensor senses a strain condition or temperature condition of said wire assembly.

16. (Original) The wire assembly of claim 12, comprising a plurality of fiber optic condition sensors each in operative association with said electrical insulator and each having a series of axially spaced apart Bragg gratings written therein for detecting strain on the electrical insulator.

17. (Original) The wire assembly of claim 12, wherein the fiber optic condition sensor is oriented substantially parallel to or spirally wound around the electrical conductor.

18. (Original) The wire assembly of claim 12, wherein the electrical insulator is a polymeric material.

19. (Original) The wire assembly of claim 18, wherein the polymeric material is extruded as a coating onto the electrical conductor.

20. (Original) The wire assembly of claim 18, wherein the polymeric material is a heat-shrunk tube, tape wrap or woven sleeve.

21. (Original) The wire assembly of claim 18, wherein the polymeric material is a polyolefin, polytetrafluoroethylene, fluorinated ethylene propylene, polyvinylidene fluoride, ethylene-tetrafluoroethylene, or polyimide.

22. (Original) The wire assembly of claim 21, wherein the polymeric material is a heat shrunk tube, tape wrap or woven sleeve.

23. (Original) An insulation wear detector system comprising a wire as in claim 11, a data acquisition system operatively connected to said fiber optic sensor for outputting a signal indicative of a predetermined change in strain of the electrical insulator, and a monitor for receiving the signal and providing an indication of said predetermined change in strain.

24. (Original) The system of claim 23, wherein said monitor provides a visual and/or aural indication of said predetermined change in strain.

25 – 43. (cancelled)